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# Effects of Candidate Position on Ballot Papers: Exploratory Visualization of Voter Choice in the London Local Council Elections 2010

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## Abstract

The relationship between candidates' position on a ballot paper and vote rank is explored in the case of London local council elections. A design study uses information visualization techniques to identify patterns and generate hypotheses. Using clustered bar-charts and spatial treemaps, the effects of ballot ordering are shown. Visual evidence is presented to suggest that the order of placement of the names of candidates acts to bias voters towards those whose names are towards the top of the ballot paper. The findings of this research have significant implications for the design of ballot papers and the conduct of fair elections.

**KEYWORDS:** Data visualization, exploratory analysis, local election, political geography

## 1. Introduction

Conducting fair and neutral elections is essential to maintain democracy. The issue of what might influence voter choice and, therefore, election results has received considerable attention from politicians and researchers. One of these factors is the design of the ballot paper, including the order in which the candidates' names are listed. According to the Electoral Commission (2003), there is a possibility of alphabetical discrimination against some candidates due to their position on the ballot paper in multi-seat elections. This paper explores this possibility using London local council elections as a case study.

Local elections in the London boroughs on May 6, 2010, were part of a wider set of elections in England using the First Past The Post (FPTP) voting system. The elections were multi-seat, meaning that the voter had up to three choices for three seats in an electoral ward. The candidates' names on each ward ballot paper were listed in alphabetical order by candidates' surnames, as is the case in most elections in the world (Darcy, 1986; Miller and Krosnick, 1998; Ho and Imai, 2008).

The hypothesis explored in this paper is that there is an association between the placement of the names on a ballot paper and the number of votes received by a candidate. Two aspects are considered: whether there is such a relationship within votes for a given political party; and whether there is an ordering effect that overcomes party preference.

## 2. Background

The general issue of what influences the task of choosing one or more items from a list has been a long debated area of research amongst psychological, political and other researchers. Krosnick (1991) proposed the theory of recency and primacy. The primacy effect is expected when there are number of choices listed vertically; this means that the first item in the list is the most likely one to be chosen. The Electoral Commission (2003) relied on Rallings et al. (1998) to state that there is a possible alphabetical discrimination in multi-member elections. Rallings et al. (1998) and (Rallings et al., 2006) analysed

English local election results between 1991 and 2006. With regards to the positioning of names effect, they found that the candidate listed first on the ballot paper within his/her party was more likely to get more votes than a candidate listed second or third. Both pieces of work reported a statistically significant effect of alphabetical order and yet an Electoral Commission Report undertaken between these two studies indicated that evidence of alphabetical bias was inconclusive (Electoral Commission, 2003).

Although there are tens of studies considering the ordering effect on the outcome of elections, few graphical representations have been used and the possible geographic effects of ordering have not been explored. This research takes the study of the effect of ordering a step further by representing the results of the most recent elections among London boroughs (6 May 2010) graphically through a series of analytical visualization techniques. This paper thus represents a valuable addition by examining the positioning effect in the most recent London local elections and by graphically representing the results using appropriate information visualization techniques.

### **3. Analysis and Findings**

Using the publicly available London election results, all wards and all candidates were selected for analysis. From this sampling frame, only cases where three candidates from any given party were standing for election in any ward were selected for further analysis (a total of 5,974 candidates). Each candidate was assigned a ballot position of 1, 2 or 3 depending on whether they were listed first, second or third within their party slate, and rank order 1, 2 or 3 depending on whether they received the first, second or third highest number of votes within their party. We calculated rank-position difference for each candidate to quantify the ordering effect.

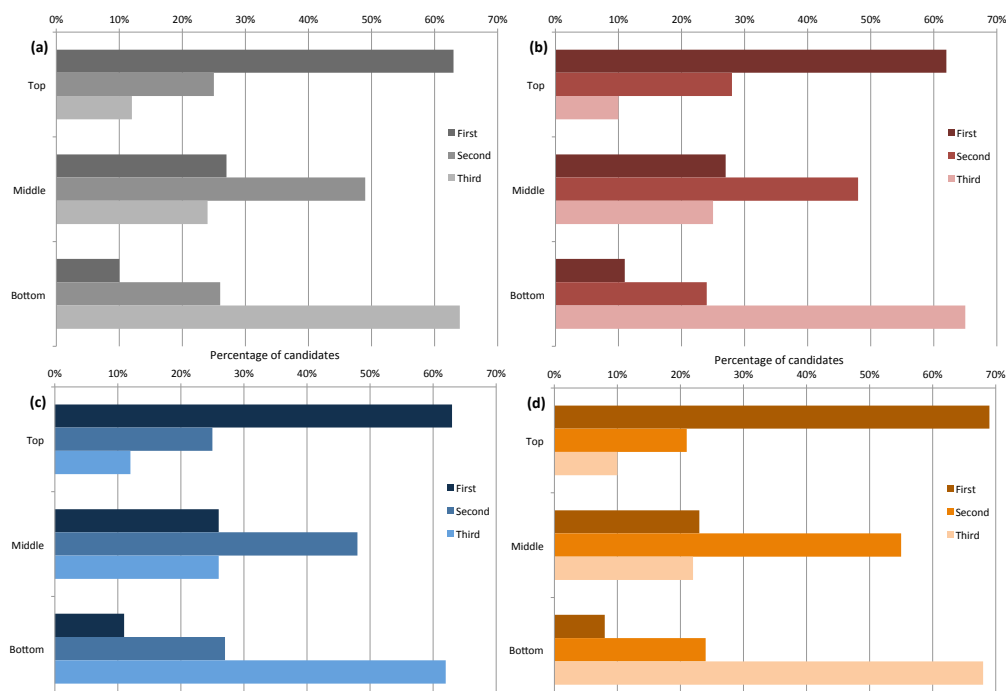
#### **3.1 Statistical Analysis**

A two-way contingency table of vote rank within party by alphabetical position within party provides an overview of the effect of ordering within parties. A chi-square test of independence led to the rejection of the null hypothesis of no association between the alphabetic order and rank within parties at the 99% level of confidence. This was also true for each of the three main parties when examined separately. This suggests a strong relationship between the candidate's position on the ballot paper and the within-party order of candidates in terms of votes returned. Furthermore, the greatest difference between the observed and expected values were at candidates listed in the alphabetical position 1 and vote rank 1 and candidates listed in the alphabetical position 3 and vote rank 3. That is, candidates who listed first on the ballot paper are more likely to finish first in the vote rank and candidates listed third are more likely to finish third in the vote rank. A similar contingency table of vote rank across all parties by ballot position was also calculated. The chi-squared test allowed us to reject the null hypothesis at the 95% level. That is, the ordering effect was sufficiently strong that on average, candidates nearer the top of the ballot paper were more likely to be elected regardless of party.

#### **3.2 Visual Analysis**

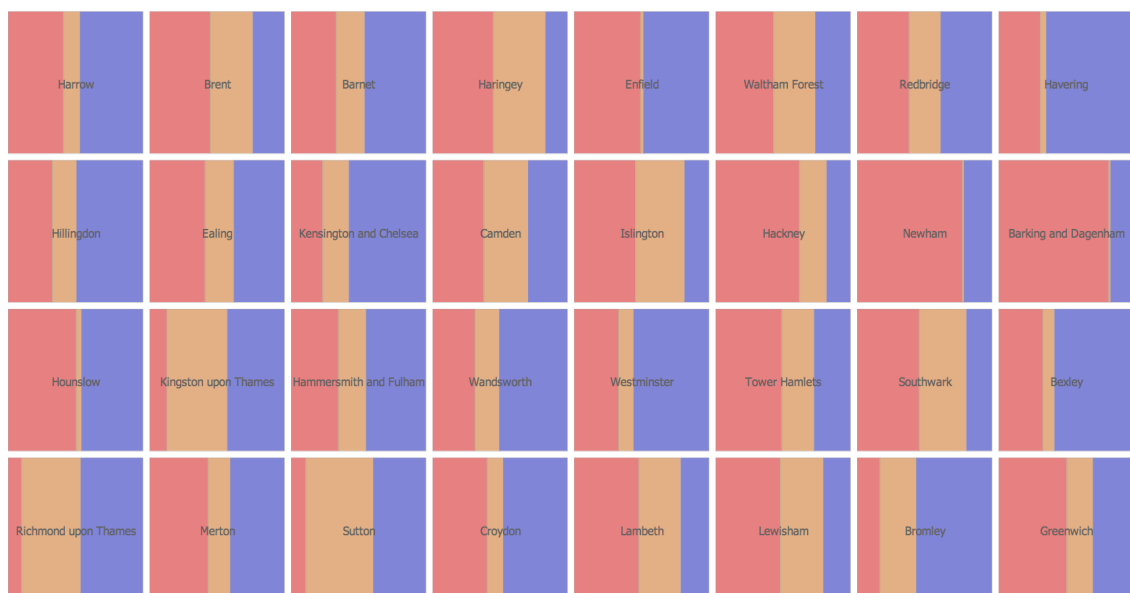
To examine ordering effects in more detail, clustered bar charts of the 9 combinations of ballot position and within-party rank were constructed (see Figure 1). This shows that in cases where parties fielded three candidates, those positioned first within their party on the ballot paper were almost six times more likely to receive the most votes than those ranked third. Equally, those positioned last within their party are almost six times more likely to receive the smallest number of votes for their party. The effect is most strongly seen for Liberal Democrat candidates.

To explore the spatial variation in ordering effect we constructed a series of spatial treemaps (Wood and Dykes, 2008), where each London borough was arranged in its approximate geographic position.



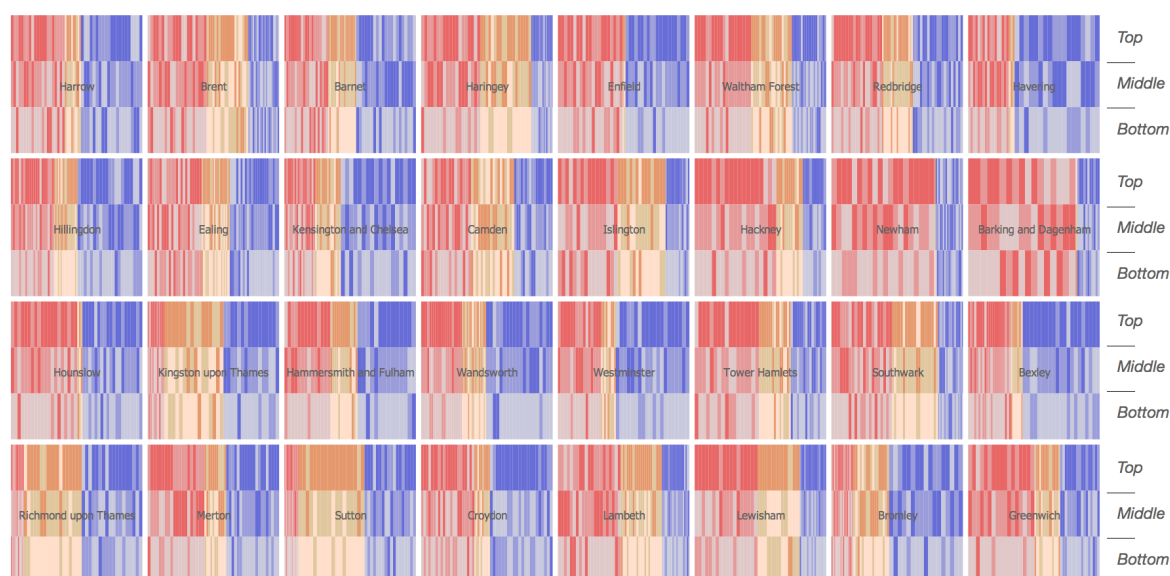
**Figure 1:** Ballot paper position and vote rank for all wards for (a) all parties; (b) Labour Party candidates; (c) Conservative Party candidates; (d) Liberal Democrat Party candidates

Various layout, ordering and colouring design options were explored using HiVE (Slingsby et al., 2009). Figure 2 shows the share of the vote between the three main parties using this form of layout. Using the same projection, Figure 3 shows the ordering effect for each ward in each borough. Colour hue is used to show party, colour saturation shows the rank order of votes within each party and vertical position within each borough reflects ballot paper position within party. It is clear to see that the top row in each borough tends to be more saturated than the bottom row indicating a strong ordering effect. Hackney and Lewisham are examples where this ordering effect is particularly strong. In contrast, Harrow and Barking and Dagenham show less of an effect. In Sutton a very strong ordering effect can be seen for the Liberal Democrats, but is less strong for the Conservatives.



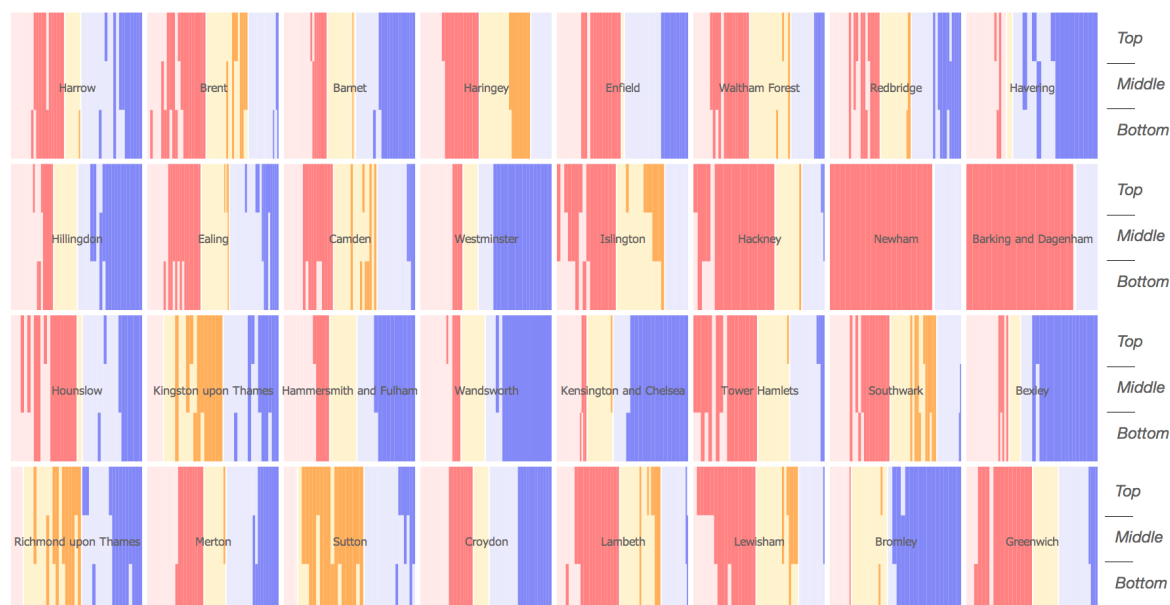
**Figure 2:** Share of the vote for Labour (red), Liberal Democrats (orange) and Conservative (blue) parties. Each square represents a London Borough in its approximate geographic position.

Figure 3 shows the effect of ordering on ranked number of votes within party, but does not indicate any



**Figure 3:** Ballot position within party (vertical position) and voting rank within party (high saturation=first; medium saturation=second; low saturation=third) for the three main parties (hue) in each ward (vertical bars) in each borough (grid squares)

inter-party effects, nor the effect on the absolute number of votes a candidate receives. Figure 4 shows the relationship between ballot position and who was elected in each ward. Saturated bars indicate an elected candidate, unsaturated bars an unelected candidate. If the ordering effect was very strong we would expect to see more saturated bars in the top third of each borough than the bottom third. In boroughs where there is strong party preference (e.g. Newham, Barking and Dagenham) there is no effect of ordering on who is elected. In more marginal wards and boroughs, the effect is stronger. For example the wards in Tower Hamlets, Islington, Lewisham and Kingston that return candidates from more than one party all show a strong ordering impact. There are a few counter examples such as Labour candidates in Brent and Liberal Democrats in Camden, but these tend to be an exception to a more general trend of elected candidates ‘tapering’ from top to bottom.



**Figure 4:** Ballot position within party (vertical position) and elected status (high saturation=elected; low saturation=not elected) for the three main parties (hue) in each ward (vertical bars ordered from left-to-right by number of votes cast) in each borough (grid squares).

## 4. Conclusions and Implications

Consistent with some studies (e.g. Rallings et al. (1998, 2006)), but in contrast to the Electoral Commission (2003) we have demonstrated a significant ballot ordering effect on number of votes received in London local multi-candidate elections. Visualization has allowed us to explore this effect in more detail examining geographic and party impacts. We found that on average Liberal Democrat candidates are more susceptible to ordering effects and in wards with more balanced distributions of party support, ordering can have significant impact. We have shown that the effect is significant enough to result in a change in the distribution of elected councillors and that in boroughs with a large number of marginal wards, this is likely to have a significant impact on the party political balance of power.

Further investigation of local factors such as the extent to which candidates are known to the public, the strength of their election campaigns, previous service and their socio-economic characteristics are feasible using the kinds of visualization outlined here. Other influences that could be examined in relation to ordering effects include marginality of the wards, the effects on smaller parties and independent candidates, and the impact of voting system (e.g. FPTP vs AV). These findings have significant implications for the design of ballot papers and the conduct of fair elections.

## 5. Acknowledgements

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## **7. Biography**

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